

**Amendments to the claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently Amended) Apparatus for In a communication system  
having a sending station of a communication system at which send data is sent upon a  
~~communication~~  
channel susceptible to fading, ~~an improvement of the send data formed of data symbols,~~  
each data symbol having a real coordinate and an imaginary coordinate, said apparatus  
for the sending station for converting the send data into a form to facilitate  
communication thereof upon the communication channel, said apparatus comprising:  
  
a coordinate interleaver adapted to receive the data symbols ~~coupled~~  
~~to receive modulated and rotated symbols representative of the send data and to receive~~  
~~indications of communication conditions upon the communication channel, each receive~~  
~~symbol at least selectably formed of a first coordinate and a second coordinate, said~~  
coordinate interleaver selectably for interleaving ~~at least selected~~ coordinates of selected  
~~ones of the modulated and rotated~~ the data symbols according to a selected interleaving  
scheme to form interleaved symbols, ~~interleaving of the selected coordinates according to~~  
~~the selected interleaving responsive, at least in part, to the indications of the~~  
~~communication conditions, the interleaved symbols, once formed, for communication~~  
~~pursuant to a transmit diversity scheme upon the communication channel~~ such that for a  
selected data symbol, a real coordinate thereof is interleaved with a real coordinate of a

first data symbol, and an imaginary coordinate is interleaved with an imaginary

coordinate of an other<sup>said</sup> than first data symbol; and

a controller coupled to said coordinate interleaver and adapted to  
receive indications of a channel condition of the<sup>communication</sup> channel, said controller selectably for  
causing operation of said coordinate interleaver, said controller for causing the operation  
of said coordinate interleaver when the channel condition is poorer than a selected  
threshold.

2. (Original) The apparatus of claim 1 further comprising a transmit diversity creator coupled to receive indications of the interleaved symbols formed by said coordinate interleaver, said transmit diversity creator operable pursuant to<sup>a</sup> the transmit diversity scheme to cause the interleaved symbols, when sent upon the communication channel, to exhibit transmit diversity.

3. (Original) The apparatus of claim 2 wherein the transmit diversity scheme comprises a space diversity scheme, and wherein said transmit diversity creator comprises a space diversity creator to cause interleaved symbols, when communicated upon the communication channel, to exhibit space diversity.

4. (Original) The apparatus of claim 3 wherein said space diversity creator comprises a Radon-Hurwitz encoder.

5. (Currently Amended) The apparatus of claim 4 wherein said space diversity creator further comprises a first transmit antenna and at least a second transmit antenna spaced-apart therefrom, the first and at least second transmit antennas, respectively, coupled to the Radon-Hurwitz encoder, the first transmit antenna for transmitting a first data stream formed of selected interleaved symbol coordinates and the second transmit antenna for transmitting a second data stream also formed of the selected interleaved symbol coordinates.

6. (Currently Amended) The apparatus of claim 1, wherein the ~~modulated and rotated~~ data symbols to which said coordinate interleaver is coupled to receive comprise trellis coded modulated and rotated symbols.

7. (Original) The apparatus of claim 6 wherein the trellis coded modulated and rotated symbols to which said coordinate interleaver is coupled to receive comprise two-dimensional trellis coded modulated and rotated symbols.

8. (Currently Amended) The apparatus of claim 1 wherein the channel condition to which said controller is adapted to receive is communication conditions upon the communication channel, indications of which are applied to said coordinate interleaver, are determined at the sending station.

9. (Currently Amended) The apparatus of claim 8 wherein the send data sent upon the <sup>communication</sup> channel by the sending station is sent to a receiving station, wherein the receiving station and the sending station are capable of two-way communications, the receiving station further for sending receive-station data to the sending station, and wherein determinations made of the ~~communication~~ channel condition made at the sending station ~~is~~ are made responsive to indications of the receive-station data sent to the sending station.

10. (Original) The apparatus of claim 9 wherein the communication system is operable pursuant to a time division duplexing scheme wherein the send data and the receiving-station data are sent within a common frequency band.

11. (Currently Amended) The apparatus of claim 1 wherein the send data sent upon the <sup>communication</sup> channel by the sending station is sent to a the receiving station, wherein the receiving station and the sending station are capable of two-way

communications, the receiving station further for sending receive-station data to the sending station, and wherein determinations made at the sending station of the ~~communication channel~~ are condition is made at the receiving station and provided to the sending station as part of the receive-station data.

12. (Currently Amended) The apparatus of claim 1 wherein ~~In the~~ communication system ~~of claim 1 further comprising~~ comprises a receiving station for receiving the send data formed of the interleaved symbols, ~~a further improvement of~~ said apparatus further at the receiving station for operating upon the sending data, once received thereat, said apparatus further comprising:

a coordinate deinterleaver coupled to receive indications of the interleaved symbols forming the send data, said coordinate deinterleaver selectably for deinterleaving the at least selected coordinates of the ~~selected ones of the modulated and rotated~~ interleaved symbols according to a selected deinterleaving scheme, the selected deinterleaving scheme corresponding to the selected interleaving scheme.

13. (Original) The apparatus of claim 12 wherein the send data is sent as a first data stream and at least a second data stream pursuant to a space diversity scheme by the sending station, said apparatus further comprising a coordinate combiner coupled to receive representations of the send data, said coordinate combiner for selectably

combining representations of the symbols forming the send data, the representations of the symbols, once combined, forming the indications of the interleaved symbols applied to said coordinate deinterleaver.

14. (Original) The apparatus of claim 13 wherein said coordinate deinterleaver forms deinterleaved coordinates, said apparatus further comprising a decoder to which the deinterleaved coordinates are applied, said decoder for decoding the deinterleaved coordinates.

15. (Cancelled)

<sup>15</sup>  
~~16.~~ (Currently Amended) In a A method of communicating in a communication system having a sending station at which send data is sent upon a <sup>communication</sup> channel susceptible to fading, ~~an improvement of a~~ the send data formed of data symbols, each data symbol having a real coordinate and an imaginary coordinate, said method for the sending station for converting the send data into a form to facilitate communication thereof upon the communication channel, said method comprising:

selectably interleaving coordinates of modulated and rotated symbols formed at the sending station, the coordinates interleaved pursuant to a selected interleaving scheme to form interleaved symbols therefrom in which, for a selected data

symbol, a real coordinate thereof is interleaved with a real coordinate of a first data

symbol and an imaginary coordinate is interleaved with an imaginary coordinate of an

other<sup>said</sup> than first data symbol; and  
K

determining whether a channel condition upon the communication

channel is poorer than a selected threshold; if so, then

sending the interleaved symbols upon the communication channel  
utilizing a transmit diversity scheme.

<sup>16</sup>  
17. (Original) The method of claim <sup>15</sup>16 wherein said operation of sending  
comprises:

Radon-Hurwitz encoding the interleaved symbols to form Radon-  
Hurwitz encoded symbols; and

transducing the Radon-Hurwitz encoded symbols at first and at least  
second spaced-apart antenna transducers into electromagnetic form for communication  
upon the communication channel.

<sup>17</sup>  
18. (Original) The method of claim <sup>15</sup>16 wherein the send data is  
communicated to a receiving station and wherein said method further comprises the  
operation, at the receiving station, of:

deinterleaving coordinates of the interleaved symbols once received at the receiving station pursuant to a selected deinterleaving scheme, the selected deinterleaving scheme corresponding to the selected interleaving scheme.

<sup>18</sup>  
~~19.~~ (Original) The method of claim <sup>15</sup>~~16~~ further comprising the operation, prior to said operation of selectably interleaving, of trellis-code modulating the send data to form the modulated and rotated symbols.

<sup>19</sup>  
~~20.~~ (Original) The method of claim <sup>18</sup>~~19~~ wherein the modulated and rotated symbols formed during said operation of trellis-code modulating comprise two-dimensional, trellis-coded modulated and rotated symbols.